

### **REMARKS**

Claims 7-20 and 25-29 are all the claims presently pending in the application. Claims 11, 12, 19 and 20 have been amended. Claims 21-24 have been canceled. Claim 29 has been added.

While the claim amendments made herein may help to distinguish the invention over the prior art, Applicant's intention in making the amendments is for the purpose of particularly pointing out the invention, and not for the purpose of distinguishing the invention over the prior art, narrowing the claims, or for any statutory requirements of patentability. Further, notwithstanding any claim amendments made herein, Applicant's intent is to encompass equivalents of all claim elements, even if amended herein or later during prosecution.

Claims 7-10, 25, 27 and 28 stand rejected under 35 U.S.C. § 102(b) as being allegedly anticipated by Sunagawa et al. (U. S. Patent No. 6,040,090).

Claims 11-14 and 19-24 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Nakanishi et al. (US 2002/0061443) in view of Sunagawa.

Claims 15-18 and 26-28 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Sunagawa.

These rejections are respectfully traversed in view of the following discussion.

#### **I. THE CLAIMED INVENTION**

An exemplary aspect of the claimed invention (e.g., as recited in claim 7) is directed to a positive active material including a composite oxide which includes lithium (Li), manganese (Mn), nickel (Ni), cobalt (Co), and oxygen (O) and is represented by the following chemical composition formula:  $\text{Li}_a\text{Mn}_b\text{Ni}_c\text{Co}_d\text{O}_e$ , where  $0 < a \leq 1.3$ ,  $|b-c| \leq 0.05$ ,  $0.6 \leq d < 1$ ,  $1.7 \leq e \leq 2.3$ , and  $b+c+d=1$ .

Importantly, the composite oxide shows a single-phase structure belonging to space group R3-m as a result of examination by X-ray diffractometry (Application at page 46, lines 1-25).

## II. THE ALLEGED PRIOR ART REFERENCES

### A. Sunagawa

The Examiner alleges that Sunagawa teaches the invention of claims 7-10, 25, 27 and 28, and makes obvious the invention of claims 15-18 and 26-28. However, Applicant submits that there are features of the claimed invention that are not taught or suggested by Sunagawa.

In particular, Sunagawa does not teach or suggest "*wherein said composite oxide shows a single-phase structure belonging to space group R3-m as a result of examination by X-ray diffractometry*", as recited, for example, in claims 7, 8, 11, 12, 15, 15, 19 and 20 (Application at page 46, lines 1-25).

Clearly, this feature is not taught or suggested by Sunagawa.

Indeed, the Examiner again alleges on pages 3 and 4-5 of the Office Action that the oxide of Sunagawa would inherently show a single-phase structure belonging to space group R3-m as a result of examination by X-ray diffractometry (To be precise, Applicant notes that the Examiner states that "[i]t is inherent that a positive electrode material comprising  $\text{LiMn}_{0.05}\text{Ni}_{0.05}\text{Co}_{0.9}\text{O}_2$  consists essentially of a single phase structure belonging to space group R3-m as a result of examination by x-ray diffractometry". However, claim 7 does not include the phrase "consists essentially of", but recites that "said composite oxide shows a single-phase structure".)

First, Applicant would point out that MPEP 2112 (IV) provides that **the fact that a certain result or characteristic may occur or be present in the prior art is not sufficient** to establish the inherency of that result or characteristic. (e.g., see *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993). That is, inherency, may not be established by probabilities or possibilities (e.g., see *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999)).

Further, MPEP 2112 (IV) also provides that in relying upon the theory of inherency, **the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art.** (e.g., see *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990). Here, the Examiner provides no "basis in fact and/or technical reasoning"

to support his determination, but simply states that "[i]t is inherent that a positive electrode material comprising  $\text{LiMn}_{0.05}\text{Ni}_{0.05}\text{Co}_{0.9}\text{O}_2$  consists essentially of a single phase structure belonging to space group R3-m as a result of examination by x-ray diffractometry". Thus, clearly the Examiner has not shown that this feature of the claimed invention is inherent in Sunagawa.

Second, the Sunagawa reference discloses a positive electrode material having the composition deemed as  $\text{LiMn}_{0.05}\text{Ni}_{0.05}\text{Co}_{0.9}\text{O}_2$  (Table 5, Example 39), which the Examiner relies on to support his position. Applicant has investigated whether  $\text{LiMn}_{0.05}\text{Ni}_{0.05}\text{Co}_{0.9}\text{O}_2$  disclosed by the Sunagawa reference as Example 39 in Table 5 shows a single-phase structure belonging to space group R3-m as a result of examination by X-ray diffractometry. As a result of Applicant's investigation, Applicant confirmed that  $\text{LiMn}_{0.05}\text{Ni}_{0.05}\text{Co}_{0.9}\text{O}_2$  disclosed by the Sunagawa reference as Example 39 in Table 5 clearly does not show a single-phase structure belonging to space group R3-m as a result of examination by X-ray diffractometry.

Therefore, contrary to the Examiner's allegation, the  $\text{LiMn}_{0.05}\text{Ni}_{0.05}\text{Co}_{0.9}\text{O}_2$  disclosed by the Sunagawa reference is not a positive electrode material which "consists essentially of a single phase structure belonging to space group R3-m as a result of examination by x-ray diffractometry".

The claimed invention is clearly novel over the Sunagawa reference, at least for the reason that since  $\text{LiMn}_{0.05}\text{Ni}_{0.05}\text{Co}_{0.9}\text{O}_2$  disclosed by the Sunagawa reference as Example 39 in Table 5 does not show "a single-phase structure belonging to space group R3-m as a result of examination by X-ray diffractometry" as recited in claim 7, and certainly does not "consist essentially of a single phase structure belonging to space group R3-m as a result of examination by x-ray diffractometry", as alleged by the Examiner.

#### The Claimed Invention

The positive active material according to the claimed invention may include a highly uniform distribution of Co, Ni and Mn, and its preparation may require carefully controlled conditions which would result in the material possessing the feature: "wherein said composite oxide shows a single-phase structure belonging to space group R3-m as a result of examination

by X-ray diffractometry”. Those controlled conditions are disclosed by way of examples in the specification of the present application (e.g., Example 5 at pages 48-49 which are attached hereto as Exhibit 1).

Sunagawa

The Sunagawa reference discloses two methods for preparing a positive electrode active material which can substantially be classified into the method employed in Example 1 (column 6, lines 53-65) (hereinafter referred to as “Preparation Method A”) and the method employed in Example 20 (column 7, line 66 to column 8, line 16) (hereinafter “Preparation Method B”).

It is not clear from the Sunagawa reference which of the two methods was employed to prepare the positive electrode active material according to Example 39 of Table 5. The following is found in Sunagawa at column 14, lines 1-7: “In the aforementioned Examples 20 to 23, sodium hydroxide is simply added to the aforesaid mixture solution of sulfates of Ni, Co, Mn and Al thereby coprecipitating the hydroxide of these metals. In this case, however, a pH adjuster, such as ammonia, may be added to control the rate of formation of the hydroxide of these metals for uniform combination of these metals”.

Preparation Method B of the Sunagawa reference is similar to the method employed in Example 5 of the specification of the present application, but lacks that part of the method employed in Example 5 of the specification of the present application which is framed in pages 48-49 of the present specification in Exhibit 1.

That is, the adjustment of the pH is important for the preparation of the positive active material according to the present application, but the mere adjustment of the pH is not sufficient. The value to which the pH is adjusted is important and if it is not proper, it may be difficult to obtain the claimed invention (e.g., it is impossible to obtain the positive active material according to the present application).

The Sunagawa reference does not contain any disclosure suggesting which of Preparation Methods A and B is better to prepare the positive active material having the composition falling within the claim scope of the present application. Regarding Preparation Method B, the

Sunagawa reference includes the statement “a pH adjuster, such as ammonia, may be added” at column 14, lines 1-7: “In the aforementioned Examples 20 to 23, sodium hydroxide is simply added to the aforesaid mixture solution of sulfates of Ni, Co, Mn and Al thereby coprecipitating the hydroxide of these metals. In this case, however, a pH adjuster, such as ammonia, may be added to control the rate of formation of the hydroxide of these metals for uniform combination of these metals”, but does not expressly teach that the pH adjustment is preferable, since the example showing the best mode of carrying out the invention does not employ any pH adjustment, and moreover, the reference uses the word “may”. Moreover, the Sunagawa reference is entirely silent about the value of the pH to be reached when its adjustment is made.

#### Conclusion

The positive active material according to the claimed invention is clearly not anticipated by the Sunagawa reference, nor would it have been obvious therefrom.

Submitted herewith (and incorporated by reference herein) is the Declaration under 37 CFR 1.132 of Mr. Daisuke ENDO who conducted the investigation. Applicant submits that the experiments conducted by Mr. Daisuke ENDO which are described in the Declaration clearly evidence that the oxide of Sunagawa does not inherently show a single-phase structure belonging to space group R3-m.

Therefore, Applicant respectfully submits that there are features of the claimed invention that are not taught or suggested by Sunagawa. Therefore, the Examiner is respectfully requested to withdraw this rejection.

#### **B. Nakanishi**

The Examiner alleges that Sunagawa would have been combined with Nakanishi to form the invention of claims 11-14 and 19-24. However, these alleged references would not have been combined as alleged by the Examiner and even if combined, the alleged combination would not teach or suggest each and every feature of the claimed invention.

Indeed, these alleged references are completely unrelated, and no person of ordinary skill

in the art would have considered combining these disparate references, absent impermissible hindsight.

In fact, the alleged references provide no motivation or suggestion to urge the combination as alleged by the Examiner. Indeed, these alleged references clearly do not teach or suggest their combination. Therefore, one of ordinary skill in the art would not have been so motivated to combine the alleged references as alleged by the Examiner. Therefore, the Examiner has failed to make a prima facie case of obviousness.

Moreover, neither Sunagawa, nor Nakanishi, nor any alleged combination thereof teaches or suggests "*wherein said composite oxide shows a single-phase structure belonging to space group R3-m as a result of examination by X-ray diffractometry*", as recited, for example, in claims 7, 8, 11, 12, 15, 15, 19 and 20 (Application at page 46, lines 1-25).

Clearly, Nakanishi does not teach or suggest these features.

Indeed, the Examiner concedes on page 4 of the Office Action that this feature is not taught or suggested by Nakanishi. However, the Examiner alleges on pages 4-5 of the Office Action that "[i]t is inherent that a positive electrode material comprising  $\text{LiMn}_{0.05}\text{Ni}_{0.05}\text{Co}_{0.9}\text{O}_2$  comprises a single phase structure belonging to space group R3-m as a result of examination by x-ray diffractometry" (emphasis added).

However, as noted above, Applicant conducted experiments (e.g., see attached Declaration) to investigate whether  $\text{LiMn}_{0.05}\text{Ni}_{0.05}\text{Co}_{0.9}\text{O}_2$  disclosed by the Sunagawa reference as Example 39 in Table 5 shows a single-phase structure belonging to space group R3-m as a result of examination by X-ray diffractometry. As a result of Applicant's investigation, Applicant confirmed that  $\text{LiMn}_{0.05}\text{Ni}_{0.05}\text{Co}_{0.9}\text{O}_2$  disclosed by the Sunagawa reference as Example 39 in Table 5 clearly does not show a single-phase structure belonging to space group R3-m as a result of examination by X-ray diffractometry.

Moreover, even assuming (arguendo) that the products obtained by using the production method as described in Sunagawa or Nakanishi may at least partially include "a structure belonging to space group R3-m", Applicant would point out that the present Application describes an exemplary aspect of the claimed invention stating "[a]s a result of examination by

X-ray diffractometry, the powder obtained was found to have a single-phase structure belonging to space group R3-m". In particular, in the working examples, the composite oxide of the claimed invention has a high purity to such an extent that whole of composite oxide may be recognized as "a single-phase structure belonging to space group R3-m" in view of the "result of examination by X-ray diffractometry", even when the composite oxide includes the other structure as an impurity.

That is, an exemplary aspect of the claimed invention may eliminate a low purity composite oxide including a structure other than "a single-phase structure belonging to space group R3-m" to such an extent that a peak belonging to the other structure is recognized in a group of peaks observed as a result of examination by X-ray diffractometry. Nowhere is this taught or suggested by the cited references.

Therefore, Applicant respectfully submits that these alleged references would not have been combined as alleged by the Examiner and even if combined, the alleged combination would not teach or suggest each and every feature of the claimed invention. Therefore, the Examiner is respectfully requested to withdraw this rejection.

### **III. FORMAL MATTERS AND CONCLUSION**

In view of the foregoing, Applicant submits that claims 7-20 and 25-29, all the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

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The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

Date:

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